UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,236	03/30/2005	Peter John Herbert Carnell	JMYS-116US	1885

23122 7590 07/02/2008

RATNERPRESTIA
P O BOX 980
VALLEY FORGE, PA 19482-0980

EXAMINER	
YOUNG, NATASHA E	
ART UNIT	PAPER NUMBER
1797	
MAIL DATE	DELIVERY MODE
07/02/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/502,236	CARNELL ET AL.	
	Examiner	Art Unit	
	NATASHA YOUNG	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8,9,11 and 14-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-9,11,14-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ayers et al (US 2,592,523) in view of Nivens et al (US 4,011,882).

Regarding claim 1, Ayers et al teaches a method of making a sulphided ion exchange resin containing primary or secondary amino groups and the concomitant removal of hydrogen sulfide and mercaptans from a non-aqueous liquid feedstock comprising passing said feedstock containing hydrogen sulphide and mercaptans through a bed of an ion exchange resin containing primary or secondary amino groups, thereby forming a sulphided ion exchange resin containing primary or secondary amino groups (see column 2, 3rd paragraph).

Ayers et al does not teach the removal of elemental sulphur from a liquid hydrocarbon feedstock.

Ayers et al discloses the use of a secondary alphatic amine in the resin (see column 2, lines 26-39).

Nivens et al discloses the use of secondary alphatic amines in a solution to remove elemental sulfur from a pipeline and the effective amount of additive insure that corrosive sulfur, sulfur compounds, and the like released from the interior pipeline walls may be complexed ad redeposited on the interior pipeline walls or maintained in a complexed noncorrosive form, which is effective in removing sulfur, sulfur compounds, and the like (see column 2, line 27 through column 3, line 29 and column 7, line 26 through column 8, line 2) such that it would have been obvious to one having ordinary skill in the art at the time the invention was may to use the corrosion inhibitor not only in interior pipeline wall but in chemical compounds to remove sulfur, sulfur compounds, and the like.

Nivens et al does not disclose passing the feedstock containing elemental sulfur through a bed of an ion exchange resin containing primary or secondary amino groups.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Ayers et al with the teachings of Nivens et al for improve purification of the liquid hydrocarbon feedstock, since the amine complex or react with elemental sulfur maintained in a complexed noncorrosive form (see Nivens et al column 4, lines 13-55 and column 7, lines 26-59).

Claims 2 and 8 depend on claim 1 such that the reasoning used to reject claim 1 will be used to reject the dependent portions of the claims.

Regarding claim 2, Ayers et al teaches the liquid hydrocarbon feedstock is passed through a bed of a hydrogen sulphide absorbent after passage through the bed of the ion exchange resin (see column 6, 3rd paragraph).

Regarding claim 8, Ayers et al teaches the liquid hydrocarbon is selected from the group consisting of natural gas liquids and gasoline (see column 1, 2nd paragraph).

Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ayers et al (US 2,592,523) and Nivens et al (US 4,011,882) as applied to claim 1 above, and further in view of Alexander et al (US 6,059,962).

Claims 3-6 depend on claim 1 such that the reasoning used to reject claim 1 will be used to reject the dependent portions of the claims.

Regarding claim 3, Ayers et al does not teach the removal of water from the ion exchange resin before use.

Alexander et al teaches too much hydration of the catalyst or acidic resin catalyst can soften the catalyst, physically agglomerate and create high pressure drops in fixed bed reactor (see column 12, 4th paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ayers et al with the teachings of Alexander et al and remove water before use for a more reliable ion exchange resin absorbent.

Regarding claim 4, Ayers et al does not teach the ion exchange resin is in the form of a fixed bed of shaped units having maximum and minimum dimensions in the range of 0.5 to 10 mm.

Ayers et al teaches a fixed bed but the size of the granular absorbent was not given (see column 2, 3rd paragraph).

Alexander et al teaches a polymeric sulfonic acid resin catalyst of an average diameter of 0.1 mm about to 2 cm (see column 12, 2nd paragraph and column 13, 3rd paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ayers et al with the teachings of Alexander et al to promote the conversion of sulfur-containing impurities to a higher boiling sulfur-containing material (see Alexander et al column 14, 2nd paragraph).

Regarding claim 5, Ayers et al does not teach the liquid hydrocarbon feedstock is contacted with the ion exchange resin bed at temperatures in the range of 10°C to +100°C under sufficient pressure that the feedstock is in the liquid state.

Ayers et al teaches a packed condenser (see column 2, 3rd paragraph), which would have sufficient pressure such that the feedstock is in the liquid state.

Alexander et al teaches the non-aqueous liquid feedstock is contacted with the ion exchange resin bed at temperatures in the range of 10°C to +100°C under sufficient pressure that the feedstock is in the liquid state (see column 1, 2nd paragraph). It is understood that since the process operates with the boiling range of the feedstock the hydrocarbons are in liquid form.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ayers et al with the teachings of Alexander et al to ensure operation within the liquid stage.

Regarding claim 6, Ayers et al does not teach the ion exchange resin is periodically regenerated by treatment with an acid.

Ayers et al does teach the regeneration of the resin (see column 6, 2nd paragraph) but this is done through a caustic wash.

Alexander et al teaches the use of an acid wash (see column 14, 1st paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ayers et al with the teachings of Alexander et al to remove the basic nitrogen-containing impurities (see Alexander et al column 14, 1st paragraph).

Claims 9, 11, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ayers et al (US 2,592,523) and Nivens et al (US 4,011,882) as applied to claim 1 above, and further in view of Duisters et al (EP 0 319 615 A1).

Claims 9 and 11 depend on claim 1 such that the reasoning used to reject claim 1 will be used to reject the dependent portions of the claims.

Regarding claim 9, Ayers et al does not teach said liquid hydrocarbon feedstock further comprises mercury or inorganic mercury compounds, and wherein at least the inlet portion of the bed of an exchange resin is sulphided before a mercury containing stream is passed through the bed, thereby to remove said mercury or organic mercury compounds from said liquid hydrocarbon feedstock.

Duisters et al teaches that mercury very often occurs in organic media, especially non-polar organic media like hydrocarbon mixtures during their process or storage (see page 2, column 1, 1st and 3rd paragraphs).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ayers et al with the teachings of Duisters et al since it is known hydrocarbons mixtures contain mercury or inorganic mercury compounds (see Duisters et al page 2, column 1, 1st and 3rd paragraphs).

Regarding claim 11, Ayers et al teaches a method for passing a liquid hydrocarbon feedstock through a bed of a sulphided ion exchange resin containing primary or secondary amino groups according to claim 1.

Ayers et al does not teach a method for the removal of mercury and organic mercury compounds from a non-aqueous liquid feedstock comprising passing the feedstock through a bed of a sulphided ion exchange resin containing primary or secondary amino groups according to claim 1.

Duisters et al does teach a method for the removal of mercury and organic mercury compounds from a non-aqueous liquid feedstock comprising passing the feedstock through a bed of a sulphided ion exchange resin (see page 2; column 1, 5th paragraph and column 2, 1st, 2nd, and 4th paragraphs).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ayers et al with the teachings of Duisters et al for added utility of mercury removal of the product taught in the Ayers et al reference.

Claim 14 depends on claim 11 such that the reasoning used to reject claim 11 will be used to reject the dependent portions of the claim.

Regarding claim 14, Ayers et al teaches the liquid is selected from the group consisting of natural gas liquids and gasoline (see column 1, 2nd paragraph).

Claims 15-16 depend on claim 11 such that the reasoning used to reject claim 11 will be used to reject the dependent portions of the claims.

Regarding claim 15, Ayers et al does not teach the ion exchange resin is in the form of a fixed bed of shaped units having maximum and minimum dimensions in the range of 0.5 to 10 mm.

Ayers et al teaches a fixed bed but the size of the granular absorbent was not given (see column 2, 3rd paragraph).

Duisters et al teaches a polymeric sulfonic acid resin catalyst of an average diameter of 0.3 mm about to 1.2 mm (see page 2, column 2, 4th paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ayers et al with the teachings of Duisters et al to remove more than 97% of the mercury in the feedstock (see page 3, column 1, 4th paragraph).

Regarding claim 16, Ayers et al does not teach the non-aqueous liquid feedstock is contacted with the ion exchange resin bed at temperatures in the range of 10°C to +100°C under sufficient pressure that the feedstock is in the liquid state.

Ayers et al teaches a packed condenser (see column 2, 3rd paragraph), which would have sufficient pressure such that the feedstock is in the liquid state.

Duisters et al teaches the non-aqueous liquid feedstock is contacted with the ion exchange resin bed at temperatures in the range of 10°C to +100°C (see page 2, column 2, 6th paragraph) under sufficient pressure that the feedstock is in the liquid state (see column page 2, column 2, 7th paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Ayers et al with the teachings of Duisters et al to remove more than 97% of the mercury in the feedstock (see page 3, column 1, 4th paragraph).

Response to Arguments

Applicant's arguments filed May 1, 2008 have been fully considered but they are not persuasive.

Although, Nivens et al discloses a method for preventing sulphur contamination of “sweet” fluids, which pass through a pipeline that previously has been used to

transport "sour" fluid, by using an intermediate "sweet" wash solution, Nivens et al additionally discloses the use of secondary alphatic amines in a solution to remove elemental sulfur from a pipeline and the effective amount of additive insures that corrosive sulfur, sulfur compounds, and the like released from the interior pipeline walls may be complexed and redeposited on the interior pipeline walls or maintained in a complexed noncorrosive form, which is effective in removing sulfur, sulfur compounds, and the like (see column 2, line 27 through column 3, line 29 and column 7, line 26 through column 8, line 2) such that it would have been obvious to one having ordinary skill in the art at the time the invention was may to use the corrosion inhibitor not only in interior pipeline wall but in chemical compounds to remove sulfur, sulfur compounds, and the like.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATASHA YOUNG whose telephone number is (571)270-3163. The examiner can normally be reached on Mon-Thurs 7:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NY

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797